

LISTING OF THE CLAIMS

1 (currently amended): A high strength molten zinc plated steel sheet characterized by comprising a steel sheet including, by wt %,

C: 0.05 to 0.40%,

Si: 0.2 to 3.0%, and

Mn: 0.1 to 2.5% and

further including at least one or two or more types of:

P: 0.001 to 0.05%,

S: 0.001 to 0.05%,

Al: 0.01% to 2%,

B: 0.0005% to less than 0.01%,

Ti: 0.01 to less than 0.1%,

V: 0.01 to less than 0.3%,

Cr: 0.01% to less than 1%,

Nb: 0.01% to less than 0.1%,

Ni: 0.01% to less than 2.0%,

Cu: 0.01% to less than 2.0%,

Co: 0.01% to less than 2.0%,

Mo: 0.01% to less than 2.0%,

with the balance comprised of Fe and unavoidable impurities, further containing a steel sheet structure including at least 2% to 20% by vol% of an austenite phase in a ferrite phase, having on its surface a Zn plating layer containing Al in a concentration of 0.01 to 1 wt% and the balance of Zn and unavoidable impurities, ~~and containing inside the steel sheet within 2 μ m from the interface of said having an average diameter of the particle size of 0.001 to 1 μ m of at least one type of oxide selected from an Al oxide, Si oxide, Mn oxide,, or complex oxide comprised of at least two of Al, Si, and Mn~~

wherein said zinc plated steel sheet is produced by the steps comprising;
heating the steel sheet without forming an external oxide layer and Fe oxides
by means of a radiant tube heating system in a continuous molten zinc plating step,
heating the steel sheet at a heating a temperature T of 650°C to 900°C in the
dual phase region during recrystallization annealing for 30 sec. to 10 min.,
reducing the steel sheet through a reducing atmosphere where a ratio
 $\text{PH}_2\text{O}/\text{PH}_2$ of the steam partial pressure PH_2O and hydrogen partial pressure PH_2 of the reducing
atmosphere is $1.4 \times 10^{-10} \times T^2 - 1.0 \times 10^{-7} \times T + 5.0 \times 10^{-4} \leq \text{PH}_2\text{O}/\text{PH}_2 \leq 6.4 \times 10^{-7} \times T^2 + 1.7 \times 10^{-4} \times$
 $T - 0.1$,
forming at least one type of internal oxide particles selected from Al oxide, Si
oxide, Mn oxide, or complex oxide composed of at least two of Al, Si and Mn having an average
diameter of the particles of 0.001 to 1 μm in a density of not more than 1×10^{11} particles/ cm^2 at a
region from the surface of the steel sheet to the depth of 2.0 μm ,
cooling the steel sheet to a temperature range of 350 to 500°C, and
maintaining the cooled steel sheet for 5 sec. to 20 min.,
performing molten zinc plating treatment in a molten zinc bath, containing
Al:0.01 to 1 wt % and a remainder of Zn, having a temperature of 450°C to 500°C,
then cooling the zinc plated steel sheet to a temperature of below 250°C with a
cooling rate of more than 5°C/sec.

Claims 2 to 6: (canceled).